

# The Intensity Factor in the Traditional Idiom of Music Making in Dagbon

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## ABSTRACT

In this article we present the results on rhythmic analysis we conducted on Tindana ritual music and dance in Dagbon, a music-dance culture located in the Northern Region of Ghana. The paper elaborates on the "Intensity Factor" in the traditional idiom of music making and explains how this expressive key component contributes to the dynamics of the ritual. The depth of our analysis shows that the intensity factor has a direct impact on the interaction between the produced sound of the lunsɔ-ensemble, (the tom-tom beaters), the bodily movements of the dancers and the input and expectations of the local community. Our results show that the Tindana ritual Tolon Jaagbo consist of intra-musical structural components and extra-musical cultural components and has homeostasis states, and transitional states inside the architectural structure of the music-dance. Our focus is on how expressive components have a direct impact on the dynamics of music making in Dagbon society. Several important concepts that characterize aspects of timing, such as "movable one" and "intensity factor", have been introduced by different authors. However, the focus was often on single aspects of timing and an overall framework was lacking. Here we attempt at integrating different concepts of expressive timing in an overall framework of embodied music interaction. An overall framework based on embodied music interaction has not yet been applied to expressive timing in African music. Instead, what we have are different concepts that define aspects of expressive timing.

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## 1 Introduction

Our work in ethnomusicology aims at unravelling and understanding the complexity of social-cultural and music interaction during ritual music-dance performances in *Dagbon* with the focus embodied music interaction, its cultural contexts, narratives and structures. We used for this study audio-visual field recordings, annotations and interpretations of these recordings. To understand African music-dance, we need to understand music-dance in its cultural context, in particular its tradition. A performance tradition is distinguished in terms of the style of its music, instrumentations and choral organization, as well as its performance practice, modes of behavior, dance styles and dance formations, distinctive costumes, make-up, masks, and objects related to the occasion of the performance. Obviously, there are several ways by which interaction with music-dance can be understood. We believe that understanding music interaction in the traditional idiom of ritual music making in *Dagbon* has much to do with the pre-defined categories.

The theoretical concept of embodied music interaction on the ritual music and dance in *Dagbon* we studied assumes that the musical stimulus and the auditory perception of music are ambiguous and that this music is cyclic and has a strong improvisa-

tional character. The theory assumes that the musical stimulus contains both “ternary-duple” and “binary – triple” meter components which are diachronic, meaning that both metric structures can be simultaneously available for embodied music perception.

We show by means of field recordings and transcriptions, sound analyses of these recordings that the ritual music in *Dagbon* consists of superposition rhythmical layers that are cyclic. Through the interaction of the different musical instruments these simple rhythmical layers interlocks with each other, creating the polyrhythm. The traditional drum ensemble called with the local name *lunsi* create the polyrhythmic patterns. The superposition of these cyclic rhythmical pattern interact with the dancers and contributes to the intensity factor of the performance.

The theory of embodied music interaction and expressive timing assumes that that African rhythm in *Dagbon* is not additive but cyclic. In the *Tindana*, ritual fertility dance of Tolon *Jaagbo* (the earth priest of Tolon), we illustrate that both “ternary-duple” and “binary – triple” meters are simultaneous present and shifted in time, creating homeostasis states and transitional states. The rhythmical shift of the “movable one” contributes to the intensity factor of the music-dance performance. This intensity factor is a kinetic is a specific dynamical aspect that drives the ritual music-dance performance of the *Tindana* in *Dagbon*.

## 1.2 The Intensity Factor

The intensity factor is the title of an article published in the late 80’s by the famous African scholar Kwabena Nketia. The article tackles aesthetical and chorographical aspects of ritual dance performances among the Ga people of Southern Ghana with emphasis on the lead singer, the first cantor [1]. What Kwabena Nketia described as ‘the intensity factor’ of the first cantor -, “ the spirit and energy the lead singer has to put into the performance to let the performance keep going”-, is very close to what we detected in the audiovisual signal of the *Tindana* ritual music-dance *Ziem* performed for the local deity *Jaagbo* in the village of Tali near Tolon. The anticipated mono-rhythmical duplets patterns played by the *lunsi* drum ensemble in front of beat drives the entire ritual music-dance performance. The intensity factor refers to the depth of feeling stimulated by the music. It is an essential source of power and strength needed to act out the performance roles. The intensity factor generates an kinetic energy by interacting with the drummers and singers whenever it was lacking in their performance and provides an integrated aural, kinesics, and visual experience that stimulates particular modes of response and bodily interaction with the music. According to Nketia findings there is a collation in ritual music between the intensity factor and:

TABLE 1. EXPRESSIVE COMPONENTS IN THE INTENSITY FACTOR BASED ON THE ARTICLE OF KWABENA NKETIA.

<b>Behavior of the performers</b>	The behavior of performers and their audiences as exemplified in the behavior of the priest medium, the modes of response, the bodily interaction with music.
<b>Aesthetical norms of the performance</b>	The aesthetical norms of the performance. The intensity factor makes the difference between the dynamics of the performances And the performance practice, modes of behavior, dance styles and dance formations, distinctive costumes, make-up, masks and objects related to the occasion of the performance. Performance tradition is distinguished in term of the style of its music, instrumentations and choral organization. A performance of the same music can be dull, bright, spirited, and exciting
<b>Selected repertoire</b>	During performances peaks of excitement can correlating with changes in the items of a repertoire.
<b>Song and song style</b>	The melodic structure, the call and respond singing style. Variations in beginnings and endings of stanzas.
<b>Performance ensemble interaction</b>	The conjunction of drumming, singing, dancing and the used performance procedures. Mechanisms of interaction between the members of a performing group and the drummers, drummers and dancers, drummers, singers and priest-medium, leader and chorus of singers and dancers, and between these and spectators in a given context of the ritual performance.
<b>Expressive components</b>	Degree of variations in loudness, loud sounds, silence sounds as expressive features, decrease in breath, changes in register or tessitura.

## 1.3 Introduction to the *Tindana* dance *Jaagbo* of Tolon

This paper has been systematically grown from a series of rhythmical analysis we conducted on a selection of audiovisual field recordings of ritual music and dance in *Dagbon*. We analyzed selections of the fertility dance *Ziem* and the ritual dances *Jera* and *Dimbu*. *Ziem* is the ritual dance of the *Tindana*, and is associated with the fetish priest. It was during transcriptions of *Tindana* drum patterns that we came across this rhythmical phenomenon in the audio signal. The rhythmic phenomenon

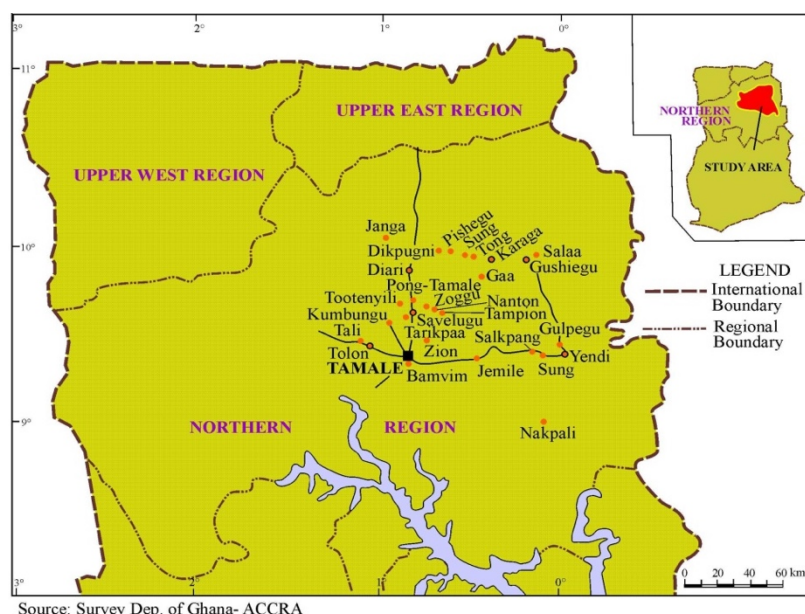
indicates a shift of one duplet in the elementary pulsation in time and dimension by the superposition of a rhythmic layer of 100ms shifted in time in front of beat. In the case of the *Tindana waa of Tolon*, the ritual dance performance called Tolon *Jaagbo*, the shifted pulse-line is only played by a single *lunsi* drummer beating a closed double skinned hourglass-shaped pressure drum and is adapted by the audience during handclapping. It forms a double secondary pulse-line on top of the elementary pulse-line. It is a rhythmical shift of one duplet in the grid, we called it ‘a grid unit’ in time which remains constant throughout the entire ritual music-dance performance.

We named this shifted second elementary pulse-line in combination with the rhythmic shift of one duplet unit in the grid in front of the primary elementary pulse-line “The Intensity Factor” because it contains a lot of kinetic energy that come out of the tension between the primary elementary pulse-line and the secondary elementary pulse-line and drives the entire ritual dance performance. The rhythmical shift of 100ms on top of beat is clearly visible in the audio signal and forms the core of this paper. It is a rhythmical structure that forms a second elementary pulse-line with its own grid shifted with one duplet in front of the primary grid that interlocks with the grid of the primary elementary pulse-line. This rhythmical structure of simultaneously two shifted elementary pulse-lines units in the grid, that occurs as first strike ahead of a strong accent or beat. Its function as an agogic kinetic energy in the sense that it drives the motor system to respond and add energy to the drive of the music-dance performance.

After naming this kinetic and rhythmical phenomenon, we started looking for relevant literature. It is only afterwards that we realized that the famous African scholar Kwabena Nketia had published an article on ‘the intensity factor’ in the late 80’s. In the analysis and transcriptions of the ritual music-dance *Ziem* for the local god *Jaagbo* of Tolon, we illustrate that both “ternary-duple” and “binary – triple” meters are simultaneously present and shifted in time, creating homeostasis states and transitional states. A phenomenon of the “movable one” was detected in the drum accompaniment that creates liminal transitional states and contributes the intensity and drive of the ritual performance. This intensity, which is in our case a kinetic energy in the music sets performs and audience to move and interact on the produced dance beat, and is a specific dynamical structural component of the ritual music-dance found *Tindana* in *Dagbon*. It is a rhythmical shift of one duplet grid unit in time which remains constant throughout the entire ritual music- dance performance.

#### 1.4 Background of the project in *Dagbon*

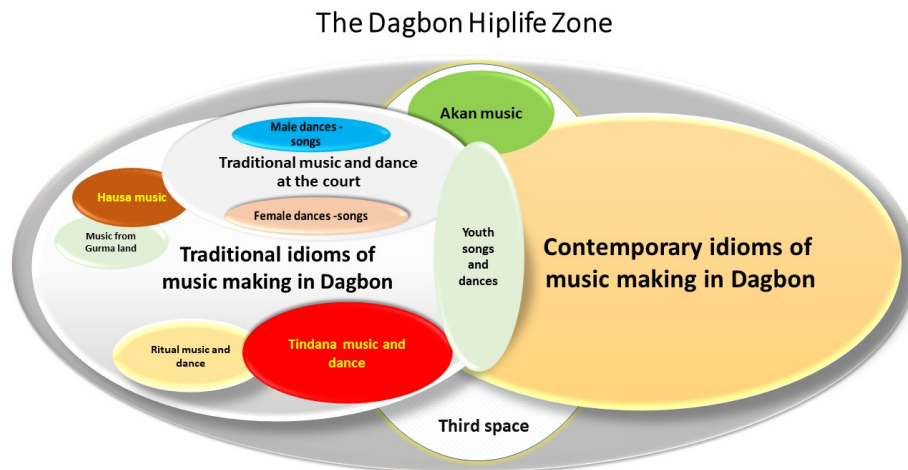
This project started as an archiving and documentation project (1999 – 2010) and aimed at documenting an endangered traditional music-dance culture of *Dagbon*. However, this project resulted in a comparative study on how key elements coming from the traditional African idiom of music making transforms, reflects, merges and continue to exist in the *Dagbon* Hiplife Zone in Ghana, a hybrid popular techno-pop and urban music culture in Tamale.



**Map 1.** Map of Northern Ghana showing *Dagbon* and the geographical scope the research area.

### 1.5 Introduction to the idioms of music making in *Dagbon* society

*Dagbon*, is a complex and well organized mainly agricultural society located in the Northern Region of contemporary Ghana. It is in a transitional state due to urbanization and globalization. Music making in *Dagbon* consists of different music-dance idioms [1]. We can distinguish one the one hand the rich but endangered and transforming traditional idioms of music-dance making, and on the other contemporary popular urban idioms of music making –developed out of these cultural transformational processes into a contemporary urban digital multimedia industry-, [2]. Both idioms interact with each other in the *Dagbon* Hiplife Zone, located and experienced in the cosmopolitan city of Tamale [3],[4].



**Figure 1.** A representation of the traditional idioms of music making in “The Hiplife Zone” in Tamale.

The production, reproduction and distribution of contemporary music-dance in this multicultural urban area is characterized by digital technologies *e.g.* the mobile phone industries and mobile internet providers, online music providers, applied multimedia productions such as. Smile Multimedia Productions etc. This is a transformational processes as elements coming from the traditional African idioms of music making have also merged and mixed with into contemporary urban digital idioms of music making The contemporary northern artists and stakeholders describe this new digital art-form as the “New School of Contemporary Hiplife in Northern Ghana” that is a product of cosmopolitan *Northern Ghanaian Artist* in Ghana, some examples being Maccasio, Fancy Gadam, Deensi and Mohammed Alidu, Umar Janda and Abu Sadiq [5].

### 1.6 Traditional idioms of music making

In *Dagbon*, the traditional idiom of music-dance making is institutionalized by the *Ya Na* ( king) at the court in Yendi, and by the several provincial chiefs and village headsmen in the urbanized towns and local villages. This institution is an elaborate interlocking network of patronage and has the appearance of a triangle with an apex. It forms part of an endangered but still dynamic cultural system embodied by the local chiefs and elders which are the main sponsors, organizers and promoters of this particular music-dance idiom. The traditional idioms of music making in *Dagbon* is an aggregate characterized by several important key factors. Traditionally, the *Dagbon* society is subdivided in, the *Nabihi* or royals, the *Tarimba* or *Dagbanbabba*, the commoners and the *Tindana*, the earth priest [6]. In the multicultural cosmopolitan city of Tamale, however, we were able to map out some intercultural dynamics as a result of globalization and transformational processes, applied digitalization technologies in the music-dance industries and urban development’s, and observed a new class in the “*Dagbon* Hiplife Zone” we named the “*Urban class*,’ or townspeople [7]. The *Tindana*, pl. *Tindanmba*, meaning ‘owner of the land’ and their children are the custodians of the Northern Territories in Ghana [8],[9].

The *Tindana* is the earth priest who has control over the land and all things attached to it. A *Tindana* is also recognized in the Dagomba administration as a chief [10]. He rules besides the chiefs as the fetish priest, just like the chiefs he sits on skin, has a palace and holds different privileges. The *Tindana* is responsible for the annual fertility rituals of the land, the harvest, the rains and setbacks. He is also responsible for the mediation between the people and the supernatural and the ritual music-dance performances for the local lesser gods *e.g.* *Tolon Jaagbo* [11], [7].

Traditional idioms of music making in *Dagbon* describes how the traditional idiom is structured and how the African idiom is represented not only a the court of the *Ya Na* (the king) in Yendi but also at the various local courts in the villages and towns.



In addition, we give a special attention to how the traditional idiom of music making is represented in the ritual music e.g. of the *Tindana* (the earth priest),



**Photo 1.** Shows a selection of the *Tindana* performances Tolon *Jaagbo* in the traditional idiom of music making in *Dagbon*.

### The African idiom of music making

To understand *Dagbon* traditional ritual music-dance, we need to understand the African idiom of music-dance making in its cultural context, in particular its ritual tradition. The African idiom of music making in *Dagbon* society is subdivided in ten essential cultural components. In this paper we focus on the tenth component which is the expressive component.

The African Idiom in Music” is an article from the anthropologist Alan P. Merriam, who identifies some key elements of the African Idiom of Sub – Saharan African music [12]. To understand African music-dance, we need to understand the African idioms of music-dance making in its cultural context, in particular its tradition. A performance tradition is distinguished in term of the style of its music, instrumentations and choral organization, as well as its performance practice, modes of behavior, dance styles and dance formations, distinctive costumes, make-up, masks, and objects related to the occasion of the performance [1].



**Photo 2.** A representation of the *Northern Ghanaian Artist* as cultural identity in the traditional idioms of music making in *Dagbon*.

The performance tradition is not only distinguished and influenced by the above categories but also by the traditional and the contemporary idioms of music making of that particular culture. Both music idioms are interacting with each other in what we call the Hiplife Zone. In this section we will discuss and show with examples how both idioms are represented in the African idiom of music making in *Dagbon*. “The African Idiom” is based on a model of musical organization and is a common ground of a liminal space or third space in how musicians and performers interact which each other and deal with musical parameters

that are reflected in the music of *Dagbon*. We borrowed the term and linked it to the music culture we studied in the Northern Region of Ghana.

The cultural and structural aspects are listed below. Out of the data we can state that these aspects of the African idiom of music making is also present in the music-dance of other surrounding musical cultures in the Northern Region of Ghana.

**TABLE 2.** TEN KEY COMPONENTS OF THE AFRICAN IDIOM OF MUSIC MAKING IN *DAGBON* SOCIETY.

COMPONENTS	MUSICAL CHARACTERISTICS
<b>First component</b>	Song with handclapping. Handclapping as an important accompanying musical instrument during songs and dances.
<b>Second component</b>	The presence and the use of a variety of drums.
<b>Third component</b>	The use and wide range of musical instruments, including the varied forms of membranophones, idiophones, chordophones and aerophones.
<b>Fourth component</b>	The use of musical instruments in the form of orchestral groups, solo instrumental performances and as accompaniment to song.
<b>Fifth component</b>	The use of body percussion as a musical instrument during songs and dances.
<b>Sixth component</b>	The lyrical use of proverbs in the song texts as a musical intercultural phenomenon.
<b>Seventh component</b>	The use of tone language/ drum language in instrumental and vocal music.
<b>Eight component</b>	Traditional music-dance is a highly hybrid cultural phenomenon, cultural transformational processes, continuity and change forms the basis of traditional African music-dance found in this part of Africa.
<b>Ninth component</b>	The use of call and responds techniques in the musical form. The call and responds singing style.
<b>Tenth component</b>	<p><b>The expressive components in Tolon Jaagbo</b></p> <ol style="list-style-type: none"> <li>Embodied music interaction of the different musicians, the dancers and the audience.</li> <li>Superposition of simple rhythmical patterns that forms rhythmical layers showing a cyclic character based on a common micro timing.</li> <li>Interlocking of intermediate rhythmical layers – superposition of simple rhythmical patterns- through the existence of an ‘elementary pulsation’ also called ‘the smallest units’, further called ‘micro timing’.</li> <li>Simultaneously double elementary pulls-lines, e.g. duple and triple meter in the architecture of the ritual music-dance: e.g. simultaneously simple triple meter and compound duple meter, e.g. <i>ziem</i>, <i>Tindana waa</i>, and simultaneously simple duple meter and compound duple meter, 2-beat and 3-beat groupings-, further called the “African Hemiola”.</li> <li>The intensity factor, the lyrical use of proverbs and how the associated narrative is enacted through the structural aspects of music related to tone, timbre, syncopated rhythms, dance and bodily movements, phraseology and speech rhythms.</li> <li>The call and response singing style.</li> <li>The improvisational character of the music-dance.</li> <li>The existence of homeostasis states and rhythmical transitional zones (liminal transitional zones).</li> <li>The existence of a ‘movable one’ in the transitional states that interlocks with the common ‘elementary pulsation’ which forms part of the architecture of the music-dance ritual.</li> <li>Superposition of simple rhythmical patterns that interlocks with the elementary pulsation of the grid.</li> </ol>

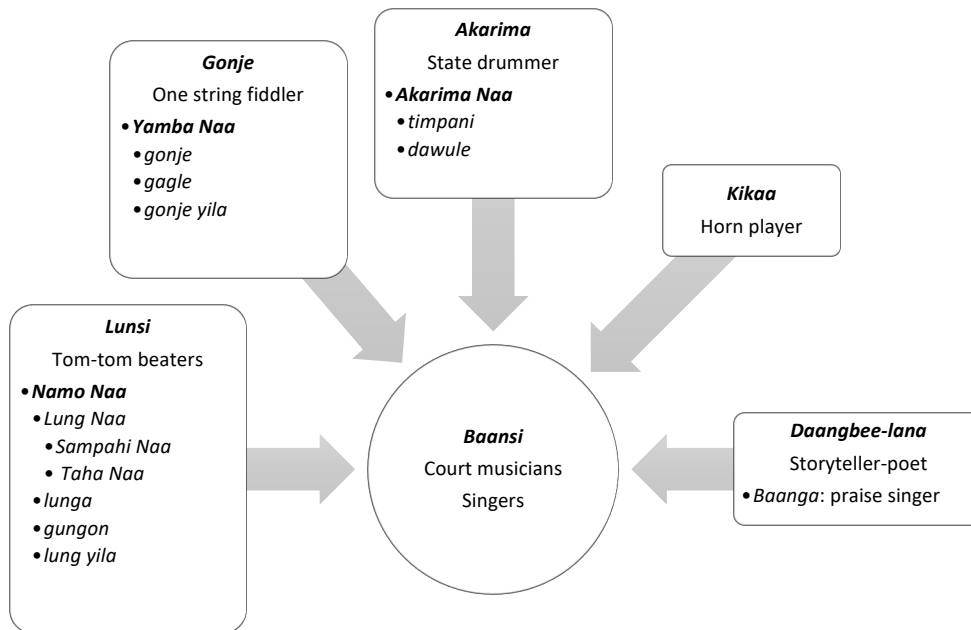
## 2 The tom-tom beaters and the modes of drumming

In *Dagbon*, drumming is institutionalized [13],[14] at the court and belongs to the aristocracy of chiefs and their offspring who maintain this cultural heritage at the *Gbewaa* palace in Yendi but also at the various local courts in the urban towns and local villages. *Lunga*: pl: *lunsi* is the drum-class in *Dagbon*. They form the most prominent class inside the *Baansi*- class, the court musicians [15]. *Lunga* refers to a practicing drummer but also to the drum. A *lunsi* ensemble is the traditional ensemble of the tom-tom beaters in *Dagbon*. It consists of *lunga* drums, closed double headed pressure drums, one or two *gungon* drums, a closed double headed cylindrical drums with external timbre and in some occasions a *dawule*, a double or single metal bell [16], [17]. *Lunsi* are not only musicians but considered princes of *Dagbon*, historians, geographers, chronicles of the past and recorders of the present [18]. There are two types of drummers in *Dagbon* with both their lineages. The *lunsi*, are the traditional drummers and the *Akarima* is the State drummer. In *Dagbon* a remarkable distinction is made towards the *lunsi* and their performance practice. They distinguish *daa lung*, the market drummers; *kali lung*, the court drummers or performances that take place at the palace. Together with the *gonje* (the one string fiddler) the *lunsi* are the only male court musicians who can participate during female music-dance activities without breaking with the traditional customs of music making [19]. On such occasions the tom-tom beaters perform mainly in the dance mode of drumming to provide the dance with a stable dance groove.



**Photo 3.** The above photos shows a selection of the wide range of drumming in the traditional idiom.

In *Dagbon*, a tom-tom beater - which is a poet, a praise singers, a historian-, has the status of a court musician, has various privileges and is highly regarded in the community. The tom-tom beater is often used by regional and paramount chiefs as a formal historical oral source during the administration of justice, such as disputes about land boundaries and chieftaincy disputes.



**Figure 2.** Shows a schematic representation of the *Baansi* - class in *Dagbon* society.

## 2.1 Modes of drumming

Kwabena Nketia, distinguished in his study on Drumming in Akan Communities three modes of drumming [20]. The speech mode of drumming, the signal mode of drumming and the dance mode of drumming. In *Dagbon* traditional idiom drumming, these three drum modes are also represented. The modes are not discrete but interacting with each other during performances. Especially in the dance mode of drumming, drummers shift and jump from one mode to another. In the case of the *Tindana* ritual *Tolon Djakboo*, drummers jump in the grid to another simultaneous rhythmical dimension and elementary pulse-line and move the oneness of the dance groove backwards. We adopted Nketia's distinction in three drum modes to our study of *Dagbon* ritual music-dance, because it is still today a valuable and useful taxonomy [21].



## 2.2 A short introduction to the *Tindana* ritual *Tolon Jaagbo*

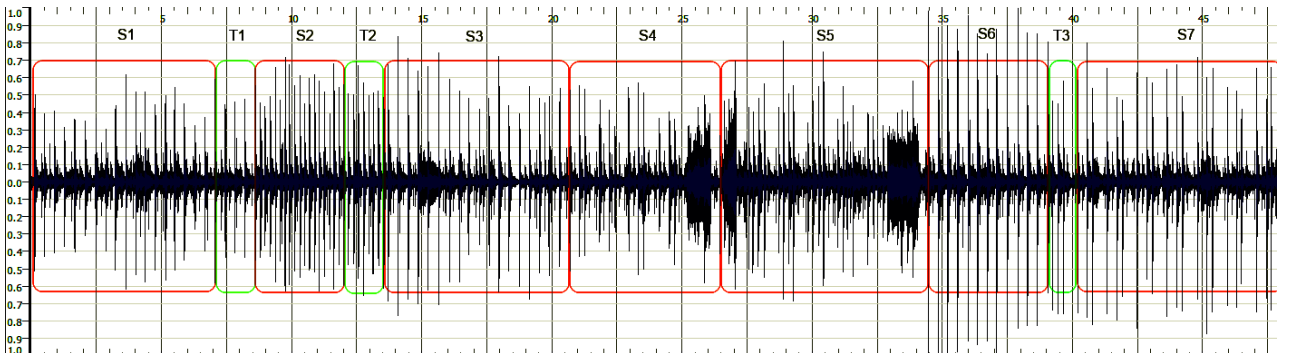
In this paper we looked at expressive timing systems of ritual music and dance of the *Tindana*. *Tindana* music-dance is situated in the traditional idiom of music-making where music-dance is merged with ritual elements, traditional symbols and cultural aspects of everyday life. *Tolon Jaagbo* is a ritual music-dance performed by the *Tindana* of Tali and his offspring during fertility rituals. The term *Jaagbo* is the local name given to the lesser god which is the zoomorphic representation of a lion. *Ziem* is the drumbeat played by the tom-tom beaters (the *lunga*, *gungon* and *dawule*) during the *Tindana* ritual, but also refers to a crowdie dance performed at the fire festival. *Ziem* also means red and symbolizes blood and is the drumbeat played at the battlefield. It is associated with war and chaos and is the collar of the head of the *Tindana*.

## 3 The Intensity Factor

Several important concepts that characterize aspects of timing systems in African music, such as simultaneous multidimensionality [22], African hemiola style [23], [24], time line patterns [25], compound cycles, multipart rhythms, and the concept of the ‘movable one’ [26] have been introduced by different authors. There are a few rhythmical phenomena that we came across in the audio signal of the *Tindana* music, which we consider a contribution to the understanding of rhythmical structures in the traditional idiom of music making in *Dagbon*.

We identified these rhythmic phenomena to provide a working hypothesis. The intensity factor is a rhythmical structure of simultaneously two shifted elementary pulse-lines units in the grid, that occurs as first strike ahead of a strong accent or beat. Its function as an agogic kinetic energy in the sense that it drives the motor system to respond and add energy to the music-dance performance.

The rhythmical phenomenon indicates a shift of a duplet in the elementary pulsation in time and in dimension by the superposition of one rhythmical layer of 100ms. It is performed, in the *Tolon Jaagbo* ritual dance, only by one *lunsi* drummer and adapted by the audience during handclapping. It forms a double secondary pulse-line on top of the elementary pulse-line. It is a rhythmical shift of one duplet grid unit in time which remains constant throughout the entire ritual music- dance performance. We named this second elementary pulsation in combination with the rhythmic shift of one duplet grid unit in front of the primary elementary pulsation line “The Intensity Factor”, because it contains a lot of kinetic energy that comes out of the tension between the primary elementary pulsation line and the secondary elementary pulsation line which drives the entire ritual dance performance. The rhythmical phenomenon is very clear visible in the audio signal.



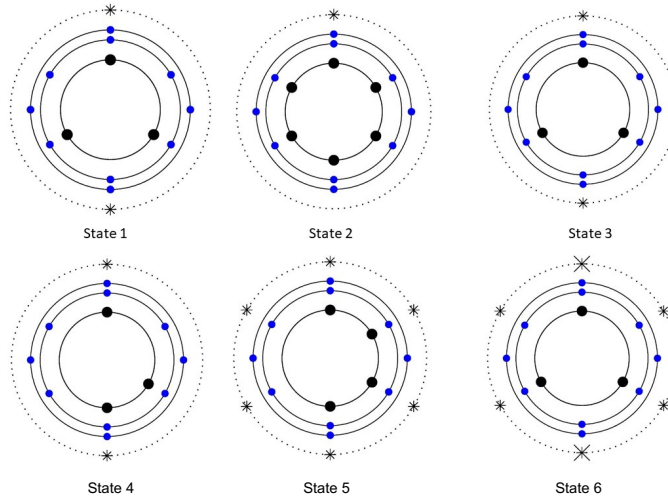
**Figure 3.** Shows a selection of the audio signal of the *Tindana* ritual dance *Tolon Jaagbo*. The stable states are indicated from S1 to S7. The transitional states are very short and are indicated from T1 to T3. Source: Field recording: MR.2000.4.8.1 [27].

**TABLE 3.** SHOWS THE DIFFERENT STATES. HOMEOSTASIS STATES ARE THE RELATIVE LONG AND STABLE STATES. TRANSITIONAL STATES ARE VERY SHORT IN TIME AND ARE DYNAMICAL. THE TRANSITIONAL STATES ARE THE MOVABLE STATES CONTAINING THE PHENOMENON THE “MOVABLE ONE” [27 ], [28 ].

	States	Starting position	Transition point	Duration in ms
S1	State 1	0	7.016	7.016



T1	Transitional zone 1	7.016	8.589	1.575
S2	State 2	8.598	11.964	3.366
T2	Transitional zone 2	11.964	13.701	1.737
S3	State 3	13.701	20.661	6.960
S4	State 4	20.661	26.406	5.754
S5	State 5	26.406	34.440	8.035
S6	State 6	34.440	39.035	4.595
T3	Transitional zone 3	39.035	40.175	1.141
S7	State 7	40.175	47.874	7.709



**Figure 4.** Shows the 6 homeostasis states we analyzed from the *Tindana waa* ritual.

One *lunga* drum pattern – playing duplets- is shifted by 100ms in time in the music. The pattern is played during the whole ritual and contributes to the rhythmic power of the ritual. This double elementary pulsation line is shifted by 100ms in the time span in front of the primary elementary pulsation line. That is phasing and synchronization of the two pulse-lines. This phasing between the two 'transient ones' with a 'oneness' in combination with the phenomenon 'moveable one', 'jumpable one' or the 'variable one' in combination with the jump-shifting of the master drummer between the primary elementary pulsation and the double elementary pulsation line creates a specific dynamic in the music-dance during the ritual. This dynamic 'intensity factor' is now being further explored in a second stage in order to determine how the intensity factor can be mathematically pre-counted in further applications.



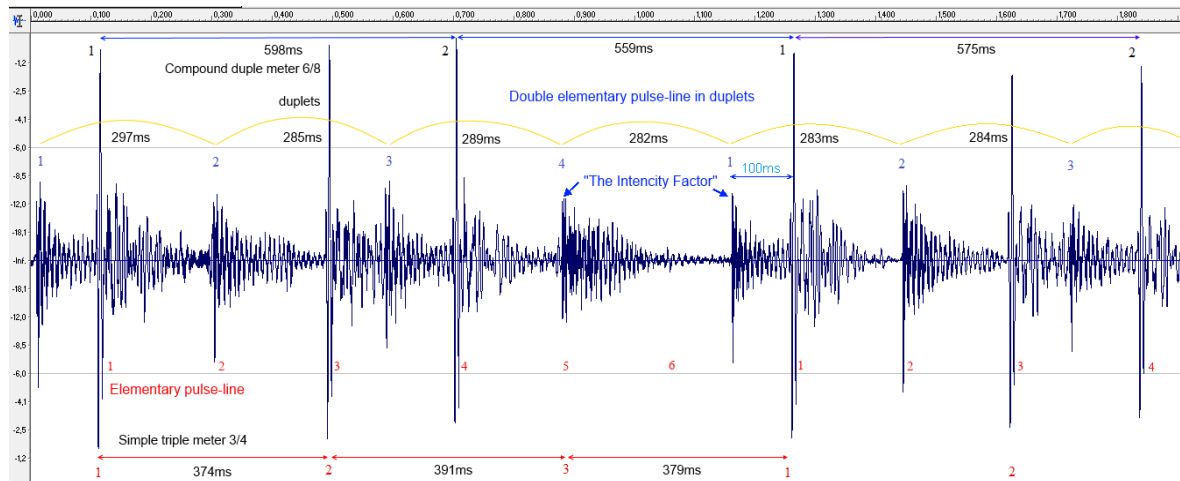
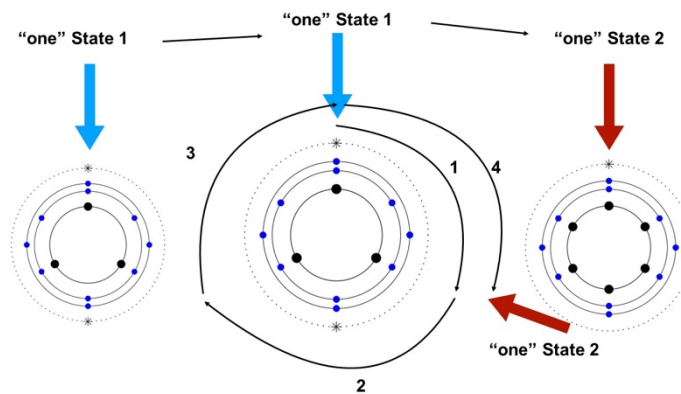


Figure 7. Shows a section of the *Tindana* dance ritual *Tolon Jaagbo* .

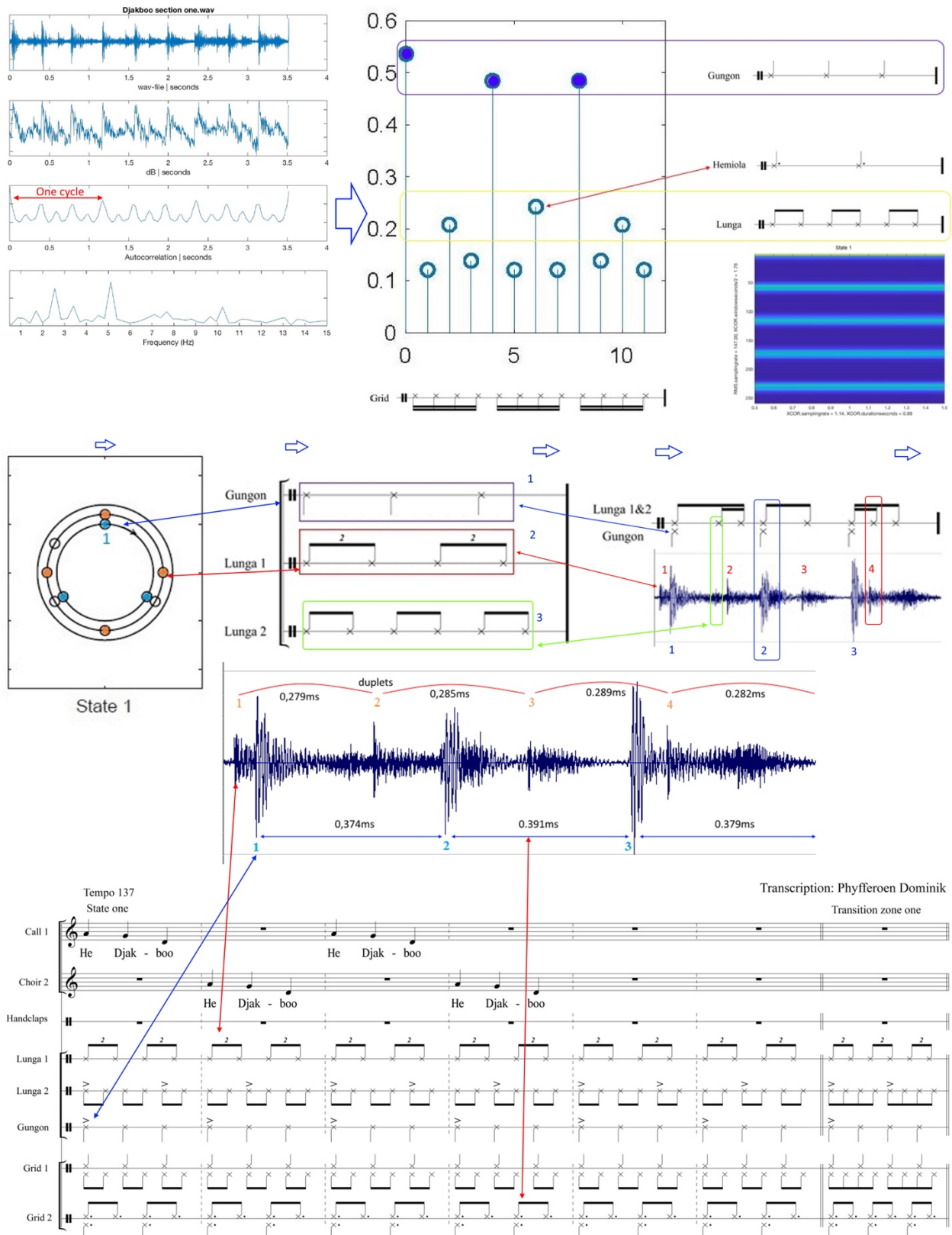
The duplets are anticipated with ca. 100ms and form part of the intensity factor. The duplets synchronizes with the elementary pulsation and the double elementary pulsation in the grid. This phenomenon of double synchronization between the two elementary pulsations in time is also called “phasing”.



$$\text{State 2} = U(\text{State 1})$$

Figure 8. Shows the ‘homeostasis state one’ and in the middle the ‘transitional state ‘one’’. Transitional states are very short in time and last only for one cycle.

### 3.1 Analysis of ‘homeostasis state one’ and ‘transitional state one’



**Figure 9.** Shows a section of the ‘homeostasis state one’ and the ‘ transition state one’ of the ritual- dance song *Jaagbo* in call and response singing style. The simultaneous multidimensionality and the superposition of the various simple rhythmical layers using a simultaneously double elementary pulls-lines anticipated in time by 100ms.



### 3.2 Analysis of ‘homeostasis state two’ and ‘transitional state two’

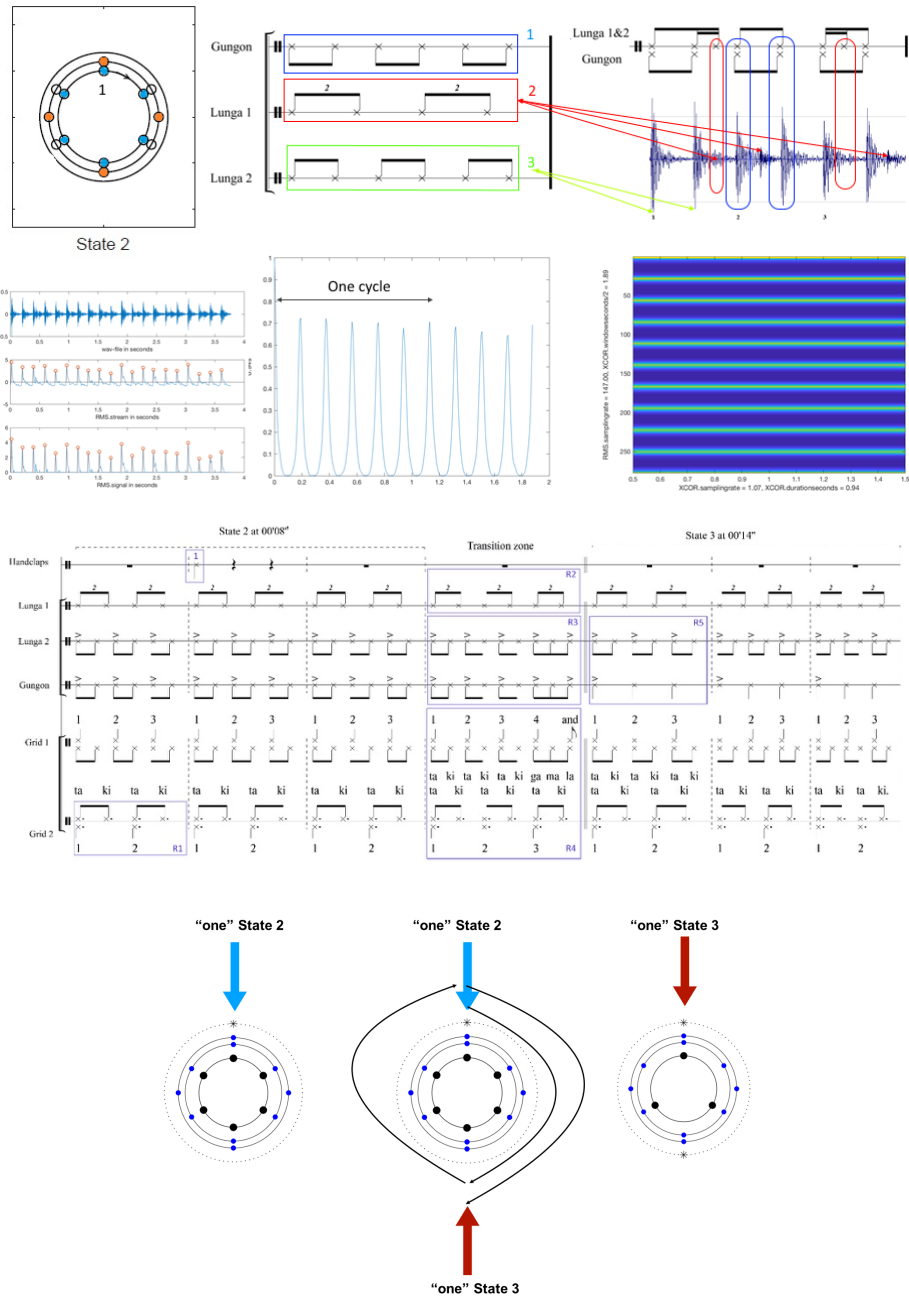
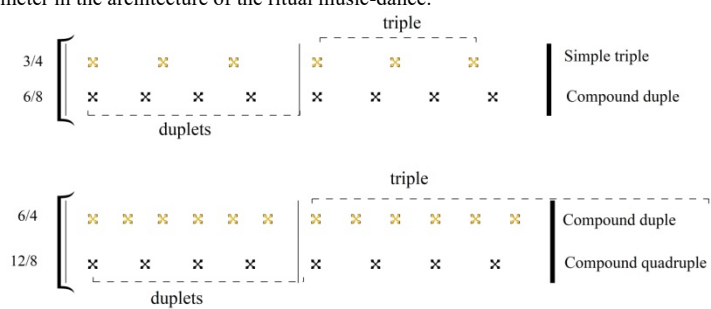


Figure 10. Shows the “homeostasis state two” and in the middle the “transitional state two”.

## 4 Defining the Intensity Factor in the traditional idiom of music making

TABLE 4. SHOWS OUR RESULTS ON DEFINING THE INTENSITY FACTOR IN THE TRADITIONAL IDIOM OF MUSIC MAKING IN *DAGBON*.

Intra-musical structural components	
Bodily interaction patterns	Bodily interaction patterns among musicians, dancers and audience can be understood as information exchange based on signs, gestures, corporeal movements. It is possible to measure them on the basis of video cameras and movement sensors. Time in African music emphasizes motion, is dynamical and contingent.

<b>African hemiola</b>	The African hemiola is a rhythmical structure that emerges from the combination (sequence, superposition) of duple and triple meter. Each section may have further subdivisions in units of 2 and 3.
<b>Rhythm layers</b>	A rhythm layer is a pattern played by one musician, or by a group of musicians. Several rhythm layers added together define cycles, states, time lines, elementary pulsation, simultaneous double elementary pulse-line, movable one, intensity factor.
<b>Cycles and states</b>	A cycle is one round of a constantly repeating rhythmical structure. Rhythm patterns are cyclic when they are repeated. Given the fact that cycles define a stable temporal organization among musicians (and dancers) they define a stable interaction state. We distinguish compound cycles (strophic forms) and short cycles ( cycles of 12-16 pulses).
<b>Time line</b>	A time line emerges from the grouping of duple and triple elementary pulses. The time line defines how time is structured in relation to movement, shown through handclapping or the beats of a simple idiophone. The guideline which is related to the time span in this manner is the time line. Often, this structuring can be related to linguistic patterns as well. It is also called an archyrhythm and rhythmic gestalt. <i>E.g. Ziem,</i>
<b>Meter</b>	Meter is regarded as a matrix of beats of different duration and position within an isochronous time span that recycles repeatedly during performance. Common meters in music <i>Dagbon</i> are: 3/4, 6/8, 2/4, 4/4 and 12/8.
<b>Spacing</b>	Rhythmic layers are organized that they interlock within the grid. In order to achieve this the parts which interlock are arranged that they start at different but specific point in time. The interlocking parts are payed differently in time thereby creating a greater density of sound that contributes to the intensity factor of the performance.
<b>Elementary pulsation</b>	Underling pulse, interlocking of rhythmical layers with an 'elementary pulsation' also called 'the grid', 'the smallest units', and 'micro timing'. x
<b>Simultaneous double elementary pulse-lines</b>	Simultaneous double elementary pulse-lines, <i>e.g.</i> simultaneously running pulse-lines duple and triple meter in the architecture of the ritual music-dance. 
<b>Reference beat or gross-pulse</b>	The reference beat is a subjective timing. It usually combine 2, 3 or 4 units of the elementary pulsation to form larger units of reference that may server dancers to find their steps, or a <i>gunгон</i> to mark the beat.
<b>Grading</b>	The organization of multipart multilinear rhythmical structures is called grading. It finds its highest expression in the music of percussion or the percussive section of aerophones and chordophone ensembles. The rhythms to be combined in this manner must be grades in density or complexity in relation to the role of each part as accompanying response or lead instrument.
<b>Movable one and state transitions</b>	The "one" is the moment within the elementary pulsation where rhythmical layer starts with cycle. When the "one" is moved, for example, the <i>gunгон</i> - player (bass-drummer) is shifting the entire cycle by one pulse, then a state transition occurs. The outcome of that state transition is a new state, with a new stable relative timing position among musicians. State transitions are short in time forming a temporal transitional zone, a liminal zone, between the old state and the next state.
<b>Intensity factor</b>	The intensity factor is a structure unit that occurs as first strike ahead of a strong accent or beat. Its function is agogical in the sense that it drives the motor system to respond and ad energy to the music-dance
<b>Collapse</b>	Collapse is the reduction of the rhythmical complexity to one of the basic metrical forms, duple rhythms or triple rhythms. This is especially relevant to dance and bodily movement.

<b>Linguistic patterns</b>	The lyrical use of proverbs and how the associated narrative is enacted through the structural aspects of music related to tone, timbre, syncopated rhythms, dances and body movements, phraseology and speech rhythms.
<b>Call and response</b>	The call and response is a large-scale structure based on a succession of two distinct phrases, where the second phrase is a direct answer to the first. <i>E.g. Call and response singing style in Tolon Jaagbo.</i>
<b>Improvisation</b>	Improvisation can be understood as idiomatic structural units on top of, or in replacement of a structural layer. Combination of different rhythmical patterns. Moving from one pattern to another, moving from one rhythmical layer in the grid to another. In <i>Dagbon</i> drum rhythms are based upon language texts and proverbs. Free rhythm: <i>E.g. Damba yila</i> and <i>gingaani</i> .
<b>Homeostasis</b>	A homeostasis is an emergent effect of interaction. It occurs when the different parts nicely fit together in a fluent state of interaction.
<b>Extra -MUSICAL ASPECTS OF THE INTENSITY FACTOR</b>	
<ol style="list-style-type: none"> <li>1. Distinctive costumes, make-up, and objects related to the occasion of the ritual performance <i>e.g.</i> amulets and regalia.</li> <li>2. The animal sacrifice.</li> <li>3. Giving of coins to the dancers and musicians.</li> <li>4. Trance and narrowed consciousness due to intoxication of the dancers and musicians as a result of drinking <i>e.g.</i> guinea corn stalk beer. (<i>Sorhum bicolar</i>).</li> <li>5. The breathing in of herbs and herbal extracts mixed with parts of roasted animal.</li> <li>6. The expectations of the group, expectation pattern.</li> </ol>	

The above table shows 18 categories of intra-musical structural components and 6 categories of extra-cultural components found during the analysis in defining the intensity factor in the traditional idiom of music making.

## 5 Conclusions

So far, our results of the analysis done on *Tindana Tolon Jaagbo lunsu* drum patterns in the dance mode of drumming shows that the ritual music-dance patterns have homeostasis states, and transitional states inside the architectural structure of the ritual music-dance. Homeostasis states are the stable states inside the music-dance groove, while the transitional states are liminal states inside the music. Transitional states are very short in time and last only a few milliseconds to a second. In the case of the *Tindana Tolon Jaagbo* the transitional states are characterized by the phenomenon of “the movable one”. In the transitional states, the *gungon*-player moves the oneness backwards in time by adding one or two beats to the dance groove. This “movable one” corresponds in the score notation with one quarter note. In short, the complex polyrhythmic patterns that emerges by means of simultaneous superposition of simple rhythmical patterns- (*e.g.* phasing) that are shifted in time by 100ms contributes to the stability, the homogeneity and the intensity of a state inside the ritual music-dance. This makes the music-dance groove dynamic, movable and danceable. The stable states form the rhythmic accompaniment of the ritual music-dance, on which is further built improvisation, adaptation, double time, division and variation techniques.

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## Annex I

### DEFINING THE TRADITIONAL IDIOM IN THE MUSIC MAKING IN DAGBON SOCIETY



A proposal of a functional categorisation and classification model of the traditional music and dance in *Dagbon*. Functional classification<sup>1</sup> of the court musicians and their musical instruments found at the court in Yendi during the period 2001 January – 2002 February.

## I. TRADITIONAL MUSICAL INSTRUMENTS FOUND IN *DAGBON* AT THE COURT

### 1.1 MUSICAL INSTRUMENTS FOUND AT THE COURT IN YENDI

Title	Court musicians	Local name	Description of the instrument type
<i>Akarima</i>	<i>Akarimas</i>	<i>Timpani</i> <sup>2</sup>	Open goblet – shaped drums played in pairs.
		<i>Dawule</i>	Double bell.
<i>Namo Naa</i>	<i>Lunsi</i>	<i>Lunga</i>	Closed double skinned hourglass – shaped pressure drums.
		<i>Gungon</i>	Closed cylindrical -shaped drums with snare.
		<i>Chagla</i>	Small metal rattle attached to the upper hand.
<i>Yanba Naa</i>	<i>Gonje</i>	<i>Gonje</i>	One – stringed fiddle with calabash resonator.
		<i>Gagle, (Tsibla)</i>	Gourd rattles. Small gourd.
<i>Kambon Naa</i>	<i>Kambonsi (waa)</i>	<i>Dala</i>	Open single skinned cylindrical shaped drums.
		<i>Dawule</i> <i>Dawule bla</i>	Double bell. Single bell.
<i>B ndeli lana</i>		<i>Binuli or binigu</i>	Gourd drums.
<i>Kikaa</i>	<i>Kikaa</i>	<i>Kikaa</i>	Transversal blown horn from wood with a thumb hole.
<i>Aligaita</i>	<i>Aligaita</i>	<i>Aligaita</i>	Double reed oboe with three finger holes.
<i>Baa a u</i>	<i>Baa a</i>	<i>Baa a</i>	A general name for traditional singers.
<i>Yuu lana</i>	<i>Yuwa</i>	<i>Yuwa</i>	Notched flute with three finger holes.
<i>Kate lana</i>	<i>Kate, (kate waa)</i>	<i>Kate</i>	Obliquely blown stalk flute with one or two finger holes.
<i>Lungyini</i>	<i>Lungyini</i>	<i>Lungyini</i>	Whistle.
<i>Siyalim lana</i>	<i>Siyalim</i>	<i>Siyalim</i>	Hive rattle.

## MUSICAL INSTRUMENTS IN THE TRADITIONAL IDIOM

### 1.2 MUSICAL INSTRUMENTS AT THE COURT

#### THE HUMAN VOICE AND BODY PERCUSSION AS A MUSICAL INSTRUMENT IN THE TRADITIONAL IDIOM OF MUSIC

Transformation number	Voices	Functions	Short Description
<b>1.2.1</b>	<b>Male songs</b>		
1.2.1.1	<b>Solo male songs Singer accompanied himself with a musical instrument</b>		<b>Solo male voices</b>
1.2.1.1.1	<i>Gonje yila</i>	Court music	Praise songs, historical songs, dynastic poetry, narrative proverbial songs.
1.2.1.1.2	<i>Lunsi yila, lung sarigu yila, gingaani yila</i>	Court music	Praise songs, historical songs, dynastic poetry, narrative songs.
1.2.1.1.3	<i>Moglo yila</i>	Court music	Praise songs, historical songs, dynastic poetry, narrative songs.
1.2.1.1.4	<i>Jinjelin yila</i>	Entertainment	Educational songs, love songs, narrative proverbial songs.
1.2.1.1.5	<i>Biegu yila</i>	Entertainment	Drinking songs, praise songs, narrative songs.
1.2.1.1.6	<i>Kuntunji yila</i>	Entertainment	Play songs for school boys, animation songs.
1.2.1.2	<b>Solo male songs</b>		<b>Solo male voices</b>

<sup>1</sup> Phyfferoen, D, Unpublished taxonomy on the Dagomba traditional musical instruments at the court in Yendi, 06.12.2005. RMCA Archive of Ethnomusicology, Tervuren, 2005.

<sup>2</sup> *Timpani*: single membrane goblet – shaped drums played in pairs. (DjeDje Jacqueline, 2008, pp 185).

	<b>Singer accompanied by other musicians with musical instruments</b>		
1.2.1.2.1	<i>Kambon waa yila</i>	Court music	Warrior songs, praise songs, historical songs, dynastic poetry, narrative proverbial songs.
1.2.1.3	<b>Male songs that serve as interludes during dances</b>		<b>Solo voice alternating with call and respond of a male choir</b>
1.2.1.3.1	<i>Bamaaya yila</i>	Ceremonial, Entertainment.	Love songs, narrative proverbial songs, dance songs, festival songs.
1.2.1.3.2	<i>Dimbu yila</i>	Court music, ritual music Funeral music traditional African religion,	Funeral songs, narrative proverbial songs, praise songs, dance songs.
1.2.1.3.2	<i>Jera yila</i>	Court music, ritual music traditional African religion.	Praise songs, narrative proverbial songs, hunting songs.
1.2.1.3.3	<i>Bla yila</i>	Court music, ritual music traditional African religion.	Praise songs, dance songs.
1.2.1.4	<b>Male songs sung during dance performances</b>		<b>Solo voice alternating with call and respond of a male choir</b>
1.2.1.4.1	<i>Nyndogu yila</i>	Court music, ritual music traditional African religion.	Funeral songs, narrative proverbial songs.
1.2.1.4.2	<i>Jinjelin yila</i>	Entertainment	Educational songs, love songs, narrative proverbial songs.
1.2.1.4.3	<i>Ziem yila</i>	Ritual music, music of the land priest, traditional African religion, animism.	Ritual war songs, songs from the land priest.
1.2.1.5	<b>Mixed songs sung during dance performances</b>		
1.2.1.5.1	<i>Tindana yila</i>	Ritual music, music of the land priest, traditional African religion, animism.	Songs from the land priest. Ritual songs, trance songs, songs associated with the local shrines and lesser gods.
1.2.1.5.2	<i>Jinjelin yila</i>	Entertainment	Educational songs, love songs, narrative proverbial songs.
<b>1.2.2</b>	<b>Female songs</b>		<b>Female voices</b>
1.2.2.1	<b>Solo female songs</b>		<b>A cappella solo songs with handclapping and body percussion</b>
1.2.2.1.1	<i>Paga yila</i>	Entertainment	Educational songs, love songs, dance songs.
1.2.2.1.2	<i>Damba yila</i>	Court music, Festival songs,	Praise songs, narrative proverbial songs.
1.2.2.2	<b>Female singing groups</b>		<b>Female solo front singer with female choir in call and respond style, with accompaniment of <i>lunsi</i> drum ensemble and handclapping and body percussion</b>
1.2.2.2.1	<i>Tora yila</i>	Entertainment	Educational songs, love songs, dance songs and songs of unity.
1.2.2.2.2	<i>Luwa yila</i>	Entertainment	Educational songs, love songs, dance songs and songs of unity.
1.2.2.2.3	<i>Damba yila</i>	Court music, Festival songs,	Praise songs, narrative proverbial songs.
1.2.2.2.4	<i>Paga yila</i>	Entertainment	Educational songs, love songs, dance songs, and songs of unity.
1.2.2.2.5	<i>Bihi yila</i>	Entertainment	Educational songs, love songs, dance songs, and songs of unity.

1.2.2.2.6	<i>Jinwara paga yila</i>	Ritual	Spirit possession songs, magic songs, ritual songs.
1.2.2.3	<b>Female work songs</b>		<b>Work songs in call and responds style</b>
1.2.3.3.1	<i>Ziga yila</i>	Work songs	Female call and respond work songs accompanied by <i>lunsi</i> drummers sung during cementing and flooring of a compound.
<b>1.2.3</b>	<b>Mixed singing groups</b>		
1.2.3.1	<i>Bihi yila</i>	Entertainment	Educational songs.
1.2.3.2	<i>Simpa yila</i>	Entertainment	Educational songs, love songs.
<b>1.2.4</b>	<b>Children songs</b>	Entertainment	Educational songs.
<b>1.2.4.1</b>	<b>Girl songs</b>		
1.2.4.1.1	<i>Bihi yila:</i>	Entertainment	Educational songs.
<b>1.2.4.2</b>	<b>Boy songs</b>	Entertainment	Educational songs.
1.2.4.2.1	<i>Kuraya kuraya</i>	Entertainment	Play game.
1.2.4.3.	<b>Talking texts, narrative</b>		
1.2.4.3.1	<i>Akrama</i> talking narrative	Court music	Dynastic poetry, narrative proverbial text.
1.2.4.3.2	<i>Kikaa</i> talking narrative	Court music	Dynastic poetry, narrative proverbial text.
<b>1.2.5</b>	<b>Body percussion</b>		
<b>1.2.5.1</b>	<b>Handclapping</b>		
1.2.5.1.1	<i>Tora yila</i>	Entertainment	Female songs with handclapping
1.2.5.1.2	<i>Luwa yila</i>	Entertainment	Female songs with handclapping
1.2.5.1.3	<i>Paga yila</i>	Entertainment	Female songs with handclapping
1.2.5.1.4	<i>Simpa yila</i>	Youth songs Entertainment	Mixed male and female youth songs
1.2.5.1.5	<i>Bihi yila</i>	Entertainment	Female songs with handclapping
<b>1.2.5.2</b>	<b>Hips and buttocks</b>		
1.2.5.2.1	<i>Tora</i>	Entertainment	Female u – shaped semi - circle dance.
<b>1.2.5.3</b>	<b>Foot stamping</b>		<b>Beating, shuffling and tapping the ground with the feet.</b>
1.2.5.3.1	<i>Bamaaya waa</i>	Ceremonial, Entertainment.	A multi-sectional circle dance, male rain dance, cow dance.
1.2.5.3.2	<i>Dimbu waa</i>	Court music, ritual music traditional African religion.	Male funeral dance.
1.2.5.3.3	<i>Jera waa</i>	Court music, ritual music traditional African religion.	Male hunting dance, funeral dance.
1.2.5.3.4	<i>Bla waa</i>	Court music, ritual music traditional African religion.	Male fire dance, funeral dance and ritual shrine dance.
1.2.5.3.5	<i>Luwa</i>	Entertainment	Semi-circular female dance. Educational songs, love songs, dance songs and songs of unity.

**TABLE 5.** TABLE SHOWS A SUMMARY OF THE MAIN KEY COMPONENTS OF THE MUSIC-DANCE CULTURE DEFINING THE TRADITIONAL IDIOM OF MUSIC MAKING IN *DAGBON*.